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(54) FLEXIBLE ELECTRONIC CIRCUIT DEVICE

(57)Abstract:
PURPOSE: To bring a profit to both of a user and a maker at the time of improving the function or changing the signal form by supplying a new program to perform the signal processing in a systemwhich is different from the system used till thenon the user side having the same fundamental circuit device.
CONSTITUTION: A signal to be processed is subjected to A/D conversion and is inputted to a fundamental circuit part 13and a flex circuit 16 can be changed to a form different from the signal processing form dependent upon only the fundamental circuit part 13 together with the function block of the fundamental circuit part 13 by the control of a microcomputer 17. That isthe flex circuit 16 can support the part which the function of the fundamental circuit part 13 cannot cover. The signal outputted from the fundamental circuit part 13 is led out to an output terminal 15 through a D/A converter 14.

CLAIMS

[Claim(s)]
[Claim 1]A flexible electronic circuit device comprising:
A basic circuit which obtains basic motion to an input signal.
A flexible circuit in which programing operation to which an exchange of a signal was connected possible in both directions to said basic circuit is possible.
It is connected to said flexible circuit and is a controllable centralized control circuit by a program about said flexible circuit.
It is a connecting means which can input said program from the exterior to said

centralized control circuit.

[Claim 2]The flexible electronic circuit device according to claim 1wherein said connecting means is a card body in which an integrated circuit in which a prime controller and a memory were built in is carried.
[Claim 3]The flexible electronic circuit device according to claim 2 in order to compensate [card body / said] operation of said flexible circuit other than said prime controller and a memorywherein a signal processor of said fixing function is also carried.
[Claim 4]In said basic circuita functional block which processes a signal of form specified beforehand is containedand in said flexible circuit. The flexible electronic circuit device according to claim 1 characterized by containing a switch group in which variable is possible with control data from said centralized control circuit in these circuit connection patterns while unit logica selectoran inverterand an unit delay machine are included at least.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application]This invention relates to the flexible electronic circuit device used for various kinds of noncommercial electronic devicesfor examplea TV apparatusa videotape recorder (it is described as VTR below)etc.
[0002]
[Description of the Prior Art]NowVTRa CD playeretc. rush into one set of an one-person timeand digital technique progressesand all application is attained. In such a situationa user's demand also desires a high-end model kinddesires a thing with an additional functionor are various. On the other handit wishes by small-quantity multiproduct production so that the maker side may also reply to a user's demand.
[0003]For exampleVTR has some from which a recording method differs. Even if it is in a television systemvarious kinds of methods and the transmission system of the additional signal are developed. On the other handthe maker is obliged to design development of VTR corresponding to an all directions typeand the development design of the television set.
[0004]
[Problem(s) to be Solved by the Invention]As mentioned abovein order for electronic devices to be variouswhen there are some their specifications neededthe user needs to arrange the model corresponding according to itand may own several sets of VTRs and the Television Sub-Division receiving set of a high-end model kind from the conventional form. In order to arrange the product of a various kind with the maker siderecombination of a factory lineredo of a designand the development design of the product needed to be performedand the great burden is placed. These daysthe cycle of goods is short and there is a big burden

for the both sides of a user and a maker further again.
[0005]Thenthis invention only owns the same basic circuit deviceand only supplies a new program to thisand a user aims it at providing the flexible electronic circuit device which makes possible signal processing of a completely different method from former.
[0006]
[Means for Solving the Problem]This invention is provided with the following.
A basic circuit which obtains basic motion to an input signal.
A flexible circuit in which programing operation to which an exchange of a signal was connected possible in both directions to said basic circuit is possible.
It is connected to said flexible circuit and is a controllable centralized control circuit by a program about said flexible circuit.
It is a connecting means which can input said program from the exterior to said centralized control circuit.

[0007]
[Function]Said flexible circuit can be supported by the centralized control circuit by the above-mentioned meanssaid basic circuit can be incorporatedit can change to the digital disposal circuit according to a programand it becomes possible to realize the signal processing function which is not in a basic circuit. By switching and inputting various kinds of programs from the outsidevarious kinds of digital disposal circuits are realizable in the range from which a flexible circuit can change.
[0008]
[Example]Hereafterworking example of this invention is described with reference to Drawings.
[0009]Drawing 1 is one working example of this inventionand shows basic constitution. Usuallythe signal which should be processed is supplied to the input terminal 11. The input terminal 11 is inputted into the analog-to-digital (A/D) converter 12and is carried out in digital one. The outgoing end of A/D converter 12 is inputted into the basic circuit unit 13. The basic circuit unit 13 includes the circuit which obtains some fundamental functions. The signal processed in this basic circuit unit 13 is inputted into the digital analog (D/A) converter 14turns into an analog signaland is drawn by the output terminal 15.
[0010]The flex circuit 16 is connected to the basic circuit unit 13 here so that a signal exchange in both directions is possible. The function is set as the basis of control of the microcomputer 17 (centralized control circuit)and the flex circuit 16 is usually mounted irrelevant [various kinds of circuits or gate arrays]. Howeverif controlled by the microcomputer 17it will be built so that a function may be exhibited in the basis of this control predetermined.
[0011]The block surrounded by a dotted line in a figure is built into the inside of electronic equipment.
The external terminal 18 is formed.
The card bodies 100101and 102 are selectively connectable with the external terminal 18. The program for operating the microcomputer 17 is stored in the card

body.
The circuit by the hardware which has a predetermined signal processing function if needed is incorporated.

[0012]According to the above-mentioned systemthe digital-disposal-circuit pattern by the flex circuit 16 can be built by inputting from the outside the program which controls the microcomputer 17. It may be a form where some circuits constructed by basic circuit unit 13 inside in this case were incorporated.
[0013]Thereforethe flex circuit 16 and the basic circuit 13 can perform signal processing accommodative according to various kinds of signals. In addition to signal processing performed only in the basic circuit unit 13a functional rise can be obtained by adding the function of the flex circuit 16.
[0014]Drawing 2 is an example to which this invention was applied.
It is the example which aimed at the functional rise in the recording system circuit of VTR.
The basic circuit unit 13 has luminosity and the chrominance-signal (Y/C) separation circuits 21the Y-signal treating part 22 to which the luminance signal separated here is suppliedand the C signal processing part 23 to which the separated chrominance signal is supplied. It has the multiplexer 24 which acts as Multiplex of the digital signal drawn from the Y-signal treating part 22 and the C signal processing part 23. The output of the multiplexer 24 is inputted into D/A converter 14.
[0015]Herethe flex circuit 16 contains switch SW1SW2and SW3. Switch SW1 can supply the output of A/D converter 12 to the 1st input edge of the Y/C separation circuits 21 or the subtractor 31coefficient multiplicationand the adding machine 32. The output of the coefficient adding machine 32 is inputted into the subtractor 31. It can dissociate from the signal or the Y/C separation circuits 21 from the adding machine 31and switch SW2 can choose either of the Y signalsand it can input it into the Y-signal treating part 22. Switch SW3 can introduce into the C signal processing part 23 either of the C signals separated in the chrominance signal or the Y/C separation circuits 21 from coefficient multiplication and the adding machine 32.
[0016]Said switch SW1 - SW3 grade are controlled by the switching signal generating part 33 controlled by a program. This working example is an example switched to the Y/C separation circuits which used frame correlation for this functional risealthough the basic circuit 13 formed the Y/C separation circuits 21 before with the radial fin type filter which used line correlation. This example is an example which was not preparing the field memory for the inside of the flex circuit 16 by chance. In order to use frame correlationtwo field memories are required as a delay meansbut the external card object 100 is equipped with the hardware which the basic circuit runs short of in this example. That isthe output of switch SW1 is inputted also into the field delay circuit 44 established in the external card object 100 while it is inputted into coefficient multiplication and the adding machine 32. The field delay circuit 45 is also established in the external card

object 100 in series with the field delay circuit 44. The output of the field delay circuit 44 and the output of the field delay circuit 45 are inputted into coefficient multiplication and the adding machine 32.
[0017]When the flex circuit 16 is switched as mentioned abovethree-dimensional Y/C isolation can be realized. That isby the field delay circuit established in the card bodythe hardware running short can be supported and a functional rise can be aimed at in the flex circuit 16.
[0018]As a gestalt of the basic circuit unit 13 and the flex circuit 16various kinds of working example is possible. For examplea Television Sub-Division-related digital disposal circuit is established in the inside of the basic circuit unit 13and many an adding machinesubtractorsinvertersmultipliersetc. are formed in flex circuit 16 insideand these are set to it so that it may be switched to various kinds of connection patterns by the switch group. If it does in this wayit will also become possible of the rest to carry out various processing treatment of the internal digital video signaland to compound the picture signal from an external card object to an internal picture signal according to a program. As a digital disposal circuit established in the inside of the basic circuit unit 13they may be the record in VTRand a regenerative-signal processing circuit.
[0019]In above-mentioned working examplewhen loading with the external card object 100it explained that the external terminal 18 also of the external card object 100 was 1 in onebut the number of the external card objects linked to the number of the external terminals 18 or this is not limited to thiseither. Although it explained that a microcomputer was built in as an external card objectit may be accessed by rule of the microcomputer 17 already carried in the product even if not built in particular. The internal configuration of the flex circuit 16 is also good for there to be a gate and unit delay.
[0020]
[Effect of the Invention]As explained aboveaccording to this inventiona userWhen only own the same basic circuit devicea new program is only supplied to thisit becomes possible to perform signal processing by a different method from former and a functional rise and signal forms are changedit is advantageous to the both sides of a user and a maker.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1]The figure showing the basic block in one working example of this invention.
[Drawing 2]The connection diagram showing the example which realized Y/C isolation with the application of this invention.
[Description of Notations]
12 [-- A flex circuit17 / -- A microcomputer18 / -- An external terminal100 / -- Card body.] -- An A/D converter13 -- The basic circuit unit14 -- A D/A

converter16